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Rubber Research Institute of Ceylon

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NOTICES

DARTONFIELD GROUP—VISITORS' DAY

Those who wish to visit the Institute are requested to do so after making an appointment. No special days are set apart as Visitors' Days and the services of the technical officers can be availed of for discussion or demonstration only by prior appointment.

PUBLICATIONS

Rubber Research Institute publications comprising Annual Reports, Quarterly Circulars and occasional Bulletins and Advisory Circulars are available without charge to the Proprietors (resident in Ceylon), Superintendents and Local Agents of rubber estates in Ceylon over 30 acres in extent. Advisory Circulars and Smallholdings Leaflets in English or Sinhalese will be available without charge to Smallholders on application. Forms of application can be supplied on request.

It will be appreciated if subscribers will return any back publications which are of no use to them.

ADVISORY CIRCULARS

The undernoted Circulars may be obtained on application at 30 cents per copy. Future issues in the series will be sent free of charge to estates and smallholders registered for the receipt of our publications:—

(5) Straining box for latex (January, 1940).
(6) Notes on the care of Budded Trees of Clone Tjirandji 1 with special reference to Wind Damage (September, 1938).
(12) Warm Air Drying House for Crepe Rubber (Reprinted 1952).
(19) Density of Planting and Thinning out (December, 1942).
(32) Crown Budding for Oidium Resistance (Revised October, 1954).
(33) Mechanical Felling of Rubber Trees (Reprinted March, 1955).
(36) Contour Lining, Holing and Filling, Cutting of Platforms, Trenches and Drains (Superseding Circular No. 4) (February, 1953).
(37A) Manuring—Magnesium Deficiencies in Rubber (July, 1954).
(37B) Potassium Deficiencies (September, 1954).
(38) Planting and After Care of Budded Stumps and Stumped Budgrafts (Superseding Circular No. 8) (March, 1953).
(39) Clonal Seed as Planting Material (Superseding Circulars No. 26 and 27) (July, 1953).
(40) Tapping of Hevea Rubber (Superseding Circulars No. 17 and 34) (June, 1954).
(41) Pink Disease (June, 1954).
(42) Sale of Budwood (June, 1954).
(42A) New Local Planting Material for Small Scale Trials on Estates (July 1955).
(43) Oidium Leaf Disease (Superseding Circulars No. 22 and 28) (June, 1954).
(44) Doplodia Dieback and Collar Rot of Hevea and Blue Spot of Crepe. Rubber (June, 1954).
(45) Phytophthora Leaf Disease and Stem Dieback of Hevea (October, 1954).

(46) White Root Disease of Hevea (Leptoporus Lignosus=Fomes Lignosus) (October, 1954).
(47) Ustulina Rot of Rubber Trees (November, 1954).
(48) Brown Root Disease of Hevea (October, 1954).
(49) Root Disease in Replanted Areas (Superseding Circular No. 31) (October, 1954).
(50) Orange Gall of Hevea (December, 1954).
(51) Bird's Eye Leaf Spot of Hevea (December, 1954).
(52) A Guide to the Cost of Replanting Rubber (December, 1954).
(53) Prevention of Coagulation in the Field (Superseding 2nd Supplement to Advisory Circular No. 17) (March, 1955).
(54) Bark Rot and Canker of the Rubber Tree (Superseding Circular No. 21) (July, 1955).
(56) Cover Crops (Superseding Circular No. 25) (October, 1955).
(57) Notes on Rubber Seedling Nurseries (Superseding Circular No. 35) (October, 1955).
(58) Notes on Budgrafting Procedure (Superseding Circular No. 1) (December, 1955).

RECOMMENDED RUBBER PLANTING MATERIAL (1955)

BY

C. A. de Silva

Ideally the desirable qualities of new clones must extend to the full period of their economic life, which includes tapping qualities of bark renewed for a second time. This barely completes a 36 year period.

The practical difficulties for making recommendations at short intervals are obvious and we have perforce to recommend clones for large scale planting after testing periods of 15 to 20 years, under local conditions, or earlier in the case of outstanding foreign clones. The obvious safeguard is to spread the risk and not plant one clone on more than 20 per cent of the total acreage of a comprehensive replanting programme carried out in a single year, or spread over a period of years. The recommendations made in this circular will not apply to the replanting of limited acreages, where the trial of new high yielding planting material is not possible, on the scale required for useful results.

A selection of planting material for large scale planting should be made, after a careful study of the description of clones given later in this circular, particularly with regard to environment the incidence of disease and wind damage.

Budded Rubber

Clones are primarily selected for good growth and high yields and as far as possible for a combination of the most desirable secondary characteristics. The inherent qualities of a clone are present in every tree, and budded rubber still remains the more reliable type of planting material compared with clonal seedlings, which vary from tree to tree in growth and yield characteristics.

The characteristics of a clone, whether they are desirable or undesirable can be counteracted to a considerable extent by environment, and planting procedure. All recommended high yielding clones are more or less susceptible to Oidium, and no clone is 100 per cent free of undesirable characteristics. In making a selection for a particular area, it is necessary to exploit the desirable characteristics of a particular clone. For instance if a high yielding clone is susceptible to wind damage, it should be planted in the more sheltered areas, and so it is with other undesirable characteristics such as susceptibility to Phytophthora diseases, Pink disease, Brown Bast, etc. It is hoped that the notes on the various clones will help those who are responsible, for making selections to adopt a particular clone or clones to suit their particular requirements.

In the case of new clones recommended for trial, on a small scale, based on results obtained from our experimental trials, it is essential that these are tried out on a small scale on estates in the various planting districts of Ceylon. There can be little doubt that these limited acreages of high yielding material on test on estates will make substantial contributions to the high average yields of budded rubber and clonal seedlings planted on a large scale. At the same time one or more of these clones may prove to be outstanding in a particular locality, and can then be selected for large scale planting independent of the general recommendations made in this circular.

Due to the variability in growth on difficult rubber growing terrain in this country and the insufficient selection of budgrafting stocks in the nurseries, a certain amount of selective thinning out in the early years is necessary even in the case of budded rubber, if improved economic yields are to be obtained on an acre basis, in keeping with the potentialities of high yielding clones.

An initial stand of 180 trees per acre will make it possible to eliminate a number of the poorest grown trees, especially the late supplies which in most cases are useless. Starting with about 150 to 160 mature trees per acre the stand can be expected to fall to about 130 to 140 trees per acre by the 4th year of tapping. In many instances this thinning out occurs naturally due to disease and wind damage. It will be necessary to artificially thin out the trees on yield characteristics, if too high a stand remains in the 3rd and 4th years of tapping. There is strong evidence, that high stands of rubber at this stage with good foliage canopy increases the incidence of bark disease and decreases the normal number of tapping days in the wet-low country districts.

The competition in growth in general, including bark renewal, will become more acute under the strain of tapping, which is carried out at the expense of growth throughout the life of the rubber tree. This condition is greatly eased by the system of reducing the stand per acre in stages as recommended above.

Clonal Seedlings

There is considerable evidence that selected "types" of clonal seedlings can yield up to the standard of the better known clones, provided the correct procedure is adopted in planting this material. It is incorrect to assume that the planting of clonal seedlings calls for less attention than in the case of budded rubber. Yields from clonal seedling areas will come up to the standard of budded rubber if selective thinning out is carried during the early years on growth and yield characteristics by adopting high initial stands.

The planting of clonal seedlings eliminates budgrafting procedure, but the selective thinning of the poorer trees, to improve the yields on an acre basis calls for a considerable knowledge of the technique of selective thinning, which in some ways makes the planting of clonal seedlings the more difficult proposition. In stating that a certain "type" of clonal seed is reliable for large scale planting, we mean that such a collection of clonal seed will give a satisfactory high percentage of desirable high yielding seedlings, which have to be selected on growth, yield and other secondary characteristics from a high initial stand, well above 200 points per acre. There is more need for selective thinning in seedlings than in the case of budded rubber.

The best grown seedling trees are not always the best yielders, therefore less initial thinning is done on growth characteristics than in the case of budded rubber. The major part of the thinning must be done on early yields when the trees are tapped. The Morris Mann system of early tapping is clearly impracticable on large commercial plantations. We start, therefore, with 180 to 200 mature trees at the commencement of tapping. We recommend a tappable criterion of 18 inches girth tapped at a reduced intensity of 67 per cent, adopting a half spiral cut once in three days. (See Advisory Circular No. 40, Page 2). In a normal plantation this can be done when the trees are about 5 years of age. The reduced intensity of tapping will minimise the incidence of Brown bast, which can be quite high in clonal seedling areas. A number of seedlings will give yields better than the best known high yielding clones. These trees must be brought up to 100 per cent tapping intensity after

2 to 3 years of less intensive tapping. The initial thinning out on yields should reduce the stand to about 150 trees per acre in the second year of tapping, and by the 4th year of tapping, when a 100 per cent tapping intensity can be adopted, the stand will be about 130 to 140 trees per acre. This brings the clearing in line with the number of trees per acre recommended in the case of budded rubber.

Recommendations

As in previous years recommended planting material is given under three categories A, B and C. This system of testing planting material is commonly adopted in all rubber planting countries. Clones are first tested on a small scale and finally the best clones suited to local conditions are adopted for planting on a large scale.

Group A

The planting material in this group can be planted up to 80 per cent of the total replanting acreage, any one clone or clonal seedling "type" can be planted up to 20 per cent of the total acreage:—

Clones AVROS 255, Wag 6278, Mil 3/2, Glen 1, PB 86, PR 107, RRIM 501.

Clonal seedlings.—(*a*) "Selfed" seed of clone Tjir 1, that is seed collected centrally from large monoclonal blocks of clone Tjir 1, with sufficient isolation to prevent crossing with other clones. Such seed sourees have been officially approved in Ceylon.

(*b*) Prang Besar Isolated Garden, (PBIG) seed from Plots C, D, and E only, which can be obtained from Malaya, through Messrs. Harrisons and Crosfield, Ltd., Colombo. The Plots C and D both have clone PB86 as one of the constituent clonal parents and a limited percentage of this seed will be found in seed collections. Seed of clone PB86 is restricted to 20 per cent in any collection by the Prang Besar Estate.

Group B

Clones and clonal seedlings in this group can be planted on 20 per cent of the total acreage, which includes the small scale trials recommended for new planting in Group C. Normally not more than 5 to 10 acres of a single clone, or "types" of clonal seed should be planted, which consist of mixed clonal seed from approved seed gardens.

Clones:—LCB 1320, RRIM 513, Nab 12, 15, and 20, PB 5/60, RLD 1, IRCI 10.

Clonal Seedlings.—"Mixed" clonal seed from gardens approved by the Rubber Research Institute of Ceylon. Collections of mixed PBIG seed from Plots C, D, E, F, G and H can be included in this class of "mixed" seedlings. A minimum of 250 trees per acre is recommended for planting seedlings in this class.

Group C

The clones in this group can be planted on a proportion of the 20 per cent of the total acreage allocated to Group B. The general recommendations for the selection and planting of these clones are given in more detail in Advisory Circular No. 42A. Normally one or two tapping tasks of each clone can be planted at 300 points per task which will later be reduced by thinning out.

Clones for Small Scale Trial in Group C.—

(*A*) Budwood available from 1954 onwards:—Clones RLD 2, RLD 4, 5, 6, 7, OE1, IRCI 7.

(*B*) Budwood available from 1955 onwards:—Clone RLD 16, RLD 19, 22, 28, 29, 30, 31, 36, 37.

(*C*) Budwood available from September 1955 onwards:—Clones RLD 9, 13, 14, 39, 41, 45, 46, 47, 48.

Applications for the above budwood should be made to the Superintendent, Dartonfield Estate, Agalawatta.

Notes on Planting Material

Clones in Group A.—AVROS 255.

(1) The clone was established in Sumatra in 1926 from an illegitimate seedling of clone AVROS 36.

(2) At the Soengei Pantjaer Station the clone gave a yield of 17.6 dry rubber per tree per year in the 5th year of tapping.

(3) At the R.R.I. of Ceylon Station in 1954, the clone gave a yield of 19.5 lb. dry rubber per tree per year in the 8th tapping year; the bark renewal is very satisfactory.

(4) Commercial yields—

	District	*Acreage*	*Tapping year*	*Yield in lb./acre/year*
1.	Ratnapura	4	7th	1,564
2.	Kurunegalla	10	6th	1,015

(5) The clone is a moderately good seed parent, but a poor seed bearer. It is not susceptible to Phytophthora diseases.

(6) It is somewhat susceptible to wind damage and Brown Bast.

(7) The colour of the manufactured crepe is pale yellow.

The clone is suited to the wet low country districts and it can be planted in sheltered areas with little susceptibility to Phytophthora diseases. The tapping for 2 to 3 years should preferably be on S/2, d/3, 67 per cent reduced intensity depending on the criterion for tappability adopted with regard to girth and age of trees.

Clone Wag 6278

(1) The clone was established in 1927 by the R.R.I. of Ceylon.

(2) At 10 years of age the 6 original budgrafts were yielding 17.1 lb. dry rubber per tree per year.

(3) Commercial yields—

District	*Acreage*	*Tapping year*	*Yield in lb. dry rubber per acre per year*
Kelani Valley	15	7th	2,090
Galle	7½	6th	1,969
Kalutara	12	6th	1,747

(4) Comparatively free of Brown-Bast and diseases of the tapping panel.

(5) A moderate seed bearer and a very reliable seed parent.

(6) The clone is somewhat late maturing and very high yields are obtained after the 5th tapping year. Yields on renewed bark are quite satisfactory.

(7) The creped sheet is pale yellow and no adverse reports have been made on latex properties in general.

(8) The clone is somewhat sensitive to soil conditions.

It can be safely planted on the lower areas on an estate with the better soil conditions. The clone can be tapped at a 100 per cent tapping intensity on a half spiral cut on alternate days. It can come up to expectations in most rubber growing districts in Ceylon on good soil.

Clone Mil 3/2:

(1) Established in 1927 by the R.R.I.C. The original 10 budgrafts yielded 17.7 lb. of dry rubber per tree per year in the 7th year of tapping. The clone has been tapped for 20 years and the yields on renewed bark are quite satisfactory.

(2) Commercial yields—

District	*Acreage*	*Tapping year*	*Yield in lb. dry rubber per acre per year*
Kelani Valley	5½	7th	1,621
Kalutara	20	7th	1,541
Ratnapura	8	8th	1,469

(3) A fair seed bearer and a very reliable seed parent.

(4) Susceptible to Phytophthora diseases, especially on the tapping panel.

(5) The clone can stand up to exposed areas and grows vigorously.

(6) The creped sheet is white and no adverse comments have been made on its latex properties in general.

The clone can be planted in all rubber growing districts in Ceylon. Because of its susceptibility to Phytophthora disease the clone should be planted on the higher slopes and hill tops of an estate, especially on eastern slopes. Special attention should be given to panel diseases during the wet weather periods. The correct use of water miscible fungicides at the proper preventive and curative concentrations and the use of waterproof applications have effectively controlled panel diseases in this clone. The clone can be tapped at 100 per cent intensity on a half spiral cut on alternate days.

Clone (Glenshiel) Glen 1

(1) This clone has been in tapping for about 15 years in Ceylon and it is definitely high yielding. The yields on a per tree basis are about the highest recorded for any clone.

(2) Commercial yields—

District	*Acreage*	*Tapping year*	*Yield in lb. dry rubber per acre per year*
Kalutara	10	5th	1,411
*Kalutara	25½	5th	1,241

*Tapped on a 67 per cent intensity.

(3) It is a good seed bearer, but not in the best class of seed parents.

(4) It is very sensitive to tapping intensity.

(5) Manufactured crepe sheet is pale yellow. The clone is defective in the uptake of magnesium which effects its latex properties for purposes of concentration. The latex is, however, suitable for other forms of primary manufacture.

(6) Due to its open crown the clone rarely suffers from wind damage.

(7) The foliage of this clone can be attacked by flying foxes. These attacks have been both seasonal and regional. This feature is no great deterrent to the large scale planting of this clone.

(8) Renewed bark is quite satisfactory.

The clone can be planted in most districts, and is specially suited to areas exposed to strong wind. The clone is generally tapped on a 67 per cent tapping intensity on a half spiral cut once in three days (S/2, d/3) throughout its tapping history, with a high standard of production. In the absence of a high incidence of Brown Bast during the first 4 to 5 years of tapping in a particular area, the tapping intensity can be increased to 100 per cent on S/2, d/2.

Clone (Prang Besar) PB 86

(1) The clone was established as early as 1923 in Malaya by the Prang Besar Company. In Ceylon it is reputed to be the best yielding clone under a variety of planting conditions.

(2) Commercial yields—

District	*Acreage*	*Tapping year*	*Yield in lb. dry rubber per acre per year*
Kelani Valley	6	7th	1,927
Kurunegalla	7	7th	1,702
Galle	7	7th	1,600
Ratnapura	16	8th	1,556
Kalutara	12	7th	1,440

(3) The clone is partially resistant to Oidium heveae and is comparatively free of Brown Bast.

(4) The clone is a prolific seed bearer, but is not considered in the best class of clone parents.

(5) The clone can be badly affected with Phytophthora pod and leaf disease with severe leaffall.

(6) The colour of crepe sheet is white to pale yellow. In Ceylon the latex of clone PB86 is not exactly suited for concentration, the magnesium content can be well in excess of safety figures. The latex is satisfactory for other forms of primary manufacture.

(7) No excessive wind damage has been recorded on this clone.

The clone can be planted in all districts, but should be planted in the more open areas on the higher slopes of an estate; especially on eastern slopes. The clone stands up well to 100 per cent tapping on a half spiral cut on alternate days. Careful routine attention should be given to correct disinfecting of tapping panels during wet weather periods.

Clone PR 107 (LCB 510)

(1) It is a West Java clone, established in 1923.

(2) The 9 original budgrafts yielded 16.7 lb. dry rubber per tree per year in the 6th year of tapping and 28.6 lb. d.r.c. in the 10th tapping year. In a clone trial carried out by the R.R.I. of Ceylon Clone PR 107 gave 14 lb. dry rubber per tree per year in the 8th tapping year.

(3) Commercial yields—

District	*Acreage*	*Tapping year*	*Yield in lb. dry rubber per acre per year*
Kalutara	13	7th	1,797
Galle	7½	6th	1,251

(4) The clone is partially resistant to Oidium and is recommended for its thick bark characteristics, but it is susceptible to Bark Canker.

(5) It is a moderate seed bearer and is considered a good seed parent.

(6) The clone is resistant to wind damage.

(7) The colour of crepe sheet is white. In certain instances a lack of mechanical stability has been reported after centrifugation due to defective nutrient uptake of phosphorus and magnesium. The latex is suitable for other forms of primary manufacture.

This clone can be planted in most districts. It is best to confine the planting of this clone to the more open areas on moderately high elevations of the estate. If possible, the eastern slopes should be selected.

Because of its susceptibility to Bark Canker, special care should be taken during wet weather periods to give the correct fungicidal applications to the tapped bark. The clone is specially recommended for planting in the Matale and Galle districts. It can be tapped on 100 per cent intensity on an alternate day half spiral cut.

Clone RRIM 501

(1) This is the best known clone in the R.R.I.M. 500 series, established and tested by the Rubber Research Institute of Malaya.

(2) It is recommended for large scale planting in its country of origin.

(3) 70 trees are yielding approximately 17 lbs. dry rubber per tree per year in the 7th year of tapping at Dartonfield Estate, R.R.I.C.

In a second clone trial at the R.R.I.C. the clone has given the following results:—

Clone	*No. of trees*	*Yield in lbs. per tree per year in tapping year*					
		3rd	*4th*	*5th*	*6th*	*7th*	*8th*
R.R.I.M. 501 ...	19	11.7	10.8	13.0	13.9	14.7	15.6
Control Tjir 1 ...	23	8.1	10.1	10.8	7.7	13.6	13.0

In Malaya clone RRIM 501 has given a yield of just over 2,000 lb. dry rubber per acre per year from 1946 to 1951 at the experimental station of the R.R.I.M.

(4) The clone is somewhat susceptible to Brown Bast.

(5) Susceptible to Pink Disease.

(6) The mechanical stability of latex is on the low side; latex in crepe sheet is pale yellow.

The clone should be planted on the slopes and hill tops avoiding areas subject to delayed humid conditions during the wet periods. The clone is useful in the Galle and Matale Districts. It will be best to tap the clone on a 67 per cent intensity at the commencement of tapping and continue at this intensity for two to three years, depending on the criterion of girth adopted for tappability. Careful observations should be made on the incidence of Pink Disease, and early control measures should be adopted if the clone is already planted in an unsuitable environment as indicated above.

Note on the 'Technical' Properties of Latex:—While various comments have been made in this article on certain of the 'technical' properties of the latex obtained from various clones, undue importance should not be attached to those comments and, in general, the overriding criteria for selection will be yield and secondary field characteristics. Thus, it is customary to associate 'technical' properties, such as a marked tendency to precoagulation, yellow latex crepe, and low mechanical stability in the finished centrifuge concentrate, with the latex from certain clones, *i.e.* to regard these porperties as 'clonal characteristics'. However, it should be remembered that the severity of these defects is not invariably independent of the season, the soil, the age of the tree and of various other environmental factors. Furthermore, the Far East R.R.I's have all carried out considerable work on the development of correcting processes (*e.g.* the use of latex anticoagulants, of bleaching agents and of other chemical additives) for these defects, which are generally associated with the non-rubber constituents of the latex and which are, therefore, amenable to treatment before or during processing.

Clonal Seedlings in Group A

Prang Besar Isolated Garden (PBIG)

The early plantations of PBIG seed were confined mostly to seed obtained from Plots C, D and E.

TABLE I

Yields of Prang Besar Isolated Garden Seedlings plots C D and E in different rubber growing districts.

District	*Area Acres*	*Original stand trs./ac*	*Present stand trs/ac*	*Trs./tapped in* 1954		*Age in Years* 10	11	12	13	14	15	16
Kalutara	55½	127	125	122	Tappings	155	149	157	153	147		
					lb/acre	1,204	1,218	11,61	1,084	10,26		
					(4 *)							
Kelani Valley	21	116	114	107	Tappings	138	142	146	139	142		
					lb/acre	925	880	970	875	954		
					(4 *)							
Ratnapura	7	150	119	119	Tappings	140	140	150	158	136	137	
					lb/acre	830	884	698	573	1,045	949	
					(2 *)							
Galle	10	143	142	141	Tappings	158	149	156	156	160		
					lb/acre	855	832	930	939	955		
					(3 *)							
Kegalle	14½	153	131	131	Tappings	152	153	156	153	147		
					lb/acre	530	632	711	812	922		
					(2 *)							
Kurunegalla and Matale	12½	129	124	122	Tappings	178	168	170	162	173	154	139
					lb/acre	1,129	1,144	1,195	1,148	1,073	1,103	974
					(4 *)							

* Tapping year when the clearing is ten years of age.

Plots C and D have clone PB86 as a constituent seed parent. At the present time the seed of clone PB86 in PBIG seed is restricted to 20 per cent.

Representative yields of PBIG seedling plantations in Ceylon are given in Table I and it will be noted that the maximum yield output on an acre basis possible with clonal seedlings of this type has not been fully exploited. The initial stands per acre have been on the low side for the selective thinning out of poor growers and yielders during the early years, even so, the yields obtained have been quite satisfactory. At the present time, PBIG seed is planted at 180 points per acre as a minimum but an initial stand per acre of over 200 trees with selective thinning down to 140 to 150 trees in the first year of tapping can be expected to give yields comparable with the best yielding clones.

We have no experience of planting seed from P.B.I.G. Plots F and G, such seed can be used only on a limited scale until its performance in this country has been tested out. The obvious safeguard is to plant high initial stands of about 250 trees per acre for more extensive thinning out.

Compared with other types of clonal seedlings, selfed seed of clone Tjir 1 has given the best results. This seed is recommended for large scale planting in Malaya and Ceylon. Table II gives some early yields of clonal seed in Malaya, and it is evident that PBIG, and Tjir 1 seedlings, give yields of about the same order. Tables IIIand IV give limited yield data for Tjir 1 seedlings in Ceylon.

TABLE II

Yield in lbs. per acre per annum of seedlings from Malaya—tapped on 100 per cent tapping intensity

Age in years	9	10	11	12
Tapping year	1	2	3	4
Tjir 1 selfed	1,033	977	1,066	1,071
Tjir 16 „	618	752	707	643
Glen 1 „	901	862	942	974
BD 5 „	730	737	712	695
PBIG Seed	1,074	1,076	1,136	1,157
PB 86 Illeg.	958	855	785	765

TABLE III

Yields per acre per annum at Dartonfield Estate on early tappings at 18 ins. girth on 67 per cent intensity.

Age in years	4/5	5/6	6/7
Tjir 1 selfed	329	505	828
PB 86 illeg.	280	435	607

TABLE IV

Yields per acre per annum of Tjir 1 Selfed Seed from an estate in Ceylon, tapped on 100 per cent intensity.

Age in years	6/7	7/8	8/9	9/10	10/11	11/12	12/13	13/14
* Block No. 1	106	477	718	813	1,211	1,422	1,764	1,718
** Block No. 2	570†	1,189†						

* 132 trees per acre, no selective thinning carried out.
** Selective thinning down from 300 trees to 175 trees per acre.
†Tapped on S/2, d/3, 67 per cent.

The yields in Table IV are particularly promising but should not be taken as average yields for Tjir 1 clonal seed in Ceylon. Tjir 1 clonal seed has only been planted in recent years in this country, and our recommendations are mostly based on the good results obtained in Malaya. The inherent qualities of this seed will remain the same in all countries, and collections of Tjir 1 seed made according to recommendations will come up to expected standards provided the correct methods are adopted for planting at a high initial stand and selective thinning on yield and growth characteristics.

From a poor initial stand of clonal seed with very limited facilities for thinning out of poor yielding trees over a period of years, the peak yields obtained about the 5th year of tapping will remain more or less static as shown by the figures given below for the yields of PBIG seedlings on a Ceylon estate:—

PBIG Seed

Acreage:	25
Date of Planting:	1938
Date first tapped:	March 1946
Tapping System:	S/2, d/2, 100 per cent.

Tapping year	*Trees per acre*	*Yield lb./acre/year*
1946	106	366
1947	107	550
1948	107	757
1949	106	760
1950	100	850
1951	100	883
1952	99	821
1953	92	860

Planting Material in Group B

Clone LCB 1320

(1) The clone was the best among 925 clones tested at the experimental station of the Netherlands Government Plantations in Indonesia.

(2) The oldest budgrafts on Tjipetir Estate gave the following yields:—

No. of trees	*Yield in lbs. d. r. c. per tree per year with age in years*							
38	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	$9\frac{1}{2}$	$10\frac{1}{2}$	$11\frac{1}{2}$	$12\frac{1}{2}$
	7.3	15.4	16.5	22.0	24.2	29.3	29.7	31.5

(3) Recent yields from commercial plantations are as follows:—

District	*Acreage*	*Tapping year*	*Yield in lb. dry rubber per acre per year*
Galle	9	6th	1067
Galle	$36\frac{1}{4}$	5th	884
Kalutara	24	2nd	575*
,,	4	2nd	679
,,	20	2nd	785
,,	41	1st	549

* Tapped on S/2, d/3, 67 per cent.

The clone has a quick growing habit and is high yielding. The early yield results do not justify the over advertisement which the clone has received in this country. Planting material recommendations in Indonesia for 1955/56 refer to Clone LCB 1320 as "robust growers as a rule are liable to breakage to a less degree on white soils than on liparite ones". The clone is a good seed parent and in Ceylon it is not very susceptible to Phytophthora diseases and can be planted on the lower slopes, which are somewhat humid during the wet monsoon periods.

The clone is not resistant to Oidium but may escape a severe attack due to its wintering habits.

The latex manufactured as creped sheet is pale yellow in colour. The magnesium content has been found to be in excess of required standards for the preparation of concentrated latex in Ceylon.

Clone RRIM 513

This is another selected clone of the R.R.I.M. 500 series. In Field 30 of the R.R.I.M. Experimental Station the clone has given 1,960 lb. dry rubber per acre per year, as an average mean yield from 1946 to 1951. In our 1940 small scale clone trial at Nivitigalakele the yield compared with control clones was as follows:—

Clone	*No. of trees tapped*	*Yield in lb. d.r.c. per tree per year. Year of tapping.*					
		3rd	*4th*	*5th*	*6th*	*7th*	*8th*
RRIM 513	24	11.2	10.5	9.2	11.1	10.1	11.1
Tj. 1	20.23	8.1	10.8	10.8	7.7	13.6	13.0
WG 6278	22	6.5	9.4	8.1	9.7	10.6	13.1

Clone RRIM 501 in the same trial in the 8th year gave 15.6 lb. d.r.c. per tree per year.

The secondary characters are good and the clone is not susceptible to Brown Bast.

The latex makes a white crepe and its mechanical stability is quite high. The recommendations for planting on a limited scale are based on its poorer yielding qualities compared with RRIM 501 under local conditions.

The bark is thin compared with other foreign clones in our 1940 trial at Nivitigalakele Estate.

Clones Nab 12, 15 and 20

These three selected Nab clones were established from selected Tjikadoe seedlings on Nabunnatenne Estate in 1939. The above three clones were the best grown in the first year of tapping. The girth figures were as follows:—

Clones	*PB* 86 *Control*	*Nab* 12	*Nab* 15	*Nab* 20	*Average for the clearing*
Girth in ins.1948	16.6	17.5	18.2	18.2	15.6

The yield figures up to 1953 are given below:—

Clones	*No. of trees tapped*	*Yield in lb. d.r.c. per tree per year. Tapping year*						
		3rd	*4th*	*5th*	*6th*	*7th*	*8th*	*9th*
Nab 12	19	8.5	12.4	13.3	15.1	15.4	17.4	16.9
Nab 15	18–20	11.6	12.8	15.9	15.0	14.7	13.6	14.7
Nab 20	12–18	10.2	16.6	15.5	16.7	14.6	18.4	15.6
Nab 17		12.2	13.6	15.2	14.9	14.2	15.6	16.0
PB 86	20	8.4	9.8	13.2	13.0	15.3	17.3	17.6
WG 6278	16.19	6.9	6.9	7.9	8.0	8.1	8.5	11.0
MK 3/2	16–19	5.7	7.5	9.9	10.4	11.2	12.5	12.3

Clone Nab 17 has given 16 lb. d.r.c. per tree per year in the 7th year of tapping, but it shows 9 cases of brown bast from a total of 20 trees. A few estates have however purchased material of this clone for trial. The clone has also been despatched to 4 rubber growing countries overseas; it may give satisfactory yields on a reduced tapping intensity, with less susceptibility to brown bast.

Clone PB 5/60

This Prang Besar clone was first introduced into our field trials in 1939 and was selected for further trial on the following results:—

1939 *Replanted Area, Dartonfield*
Yield in lb. d.r.c. per tree per year.

No. of trees tapped	1945	1946	1947	1948	1949	1950
28	5.8	6.3	8.9	10.8	11.6	10.4

In the 1946 large scale clone trial at Nivitigalakele, the yields of this clone in the first tapping year on a 67 per cent tapping intensity are quite promising as given below, compared with other clones recommended for large scale planting.

1946 *Replanted Area, Nivitigalakele,* 21 *acres*
Yield in lb. per tree per year 1954

Clones	*AV* 255	*LCB* 1320	*Tj* 1	*PR* 107	*PB* 5/60*
	5.96	6.03	4.49	4.72	5.65

* We do not supply material of this clone. Messrs. Harrisons & Crosfields Ltd. are the local Agents for the issue of this material.

Clone RLD 1

This clone is one of the earlier selections which was established from a high yielding estate seedling mother tree. It was included in our field trials in 1940.

23 trees of the clone have been in tapping since 1947. The clone is recommended for high yields, and especially for its very favourable secondary characters. Bark renewal is excellent and the clone has shown no cases of Brown Bast over 7 years of tapping on S/2, d/2, 100 per cent.

1940 *Clone Trial, Nivitigalakele* 10 *Acres*
Yield in lb. d.r.c. per tree per year.
Tapping year.

Clone	*No. of trees tapped*	1*st*	2*nd*	3*rd*	4*th*	5*th*	6*th*	7*th*	*Virgin bark thickness*
RLD 1	24	3.9	6.6	8.0	9.8	10.5	12.3	11.1	10.7 mm
PR 107	23	4.7	7.9	10.1	10.1	10.5	11.6	11.2	8.8 ,,
WG 6278	22	3.9	6.1	6.5	9.4	8.1	9.7	10.6	9.1 ,,

The clone is well worth a trial in group B, and may turn out to be an outstanding yielder under better conditions of growth compared with those in our 1940 clearing, which is quite a steep western slope, with poor soil conditions.

Clones I. R. C. I. 7, and I. R. C. I. 10 are clones of considerable promise in Indo China; the latter is about the highest yielding of the newer clones recommended in Indo China. The budwood of both clones can be supplied by the R.R.I.C. 5 to 10 acre areas each of these clones will be in keeping with our recommendations.

Planting Material in Group C

A separate circular on the choice of budded material in Group C is given in Advisory Circular No. 42A.

No further comments are necessary in the case of clonal seedlings in this group recommended in the category of "mixed" seedlings. Initial stands of 250 to 300 trees per acre are recommended with extensive selective thinning out on growth and yield characteristics as indicated earlier.

REPORT ON THE TRIAL SULPHUR-DUSTING OF RUBBER SMALLHOLDINGS IN THE KEGALLA DISTRICT IN 1955

By

W. I. Pieris

Introductory

The increasing concern of the Government for the damage caused by *Oidium* leaf disease to Rubber smallholdings and small estates, whose owners were not in a position to afford the full expenses of sulphur-dusting, manifested itself in a grant of Rs. 20,000/- from the Rubber Control Fund being released in August 1954 to enable the Rubber Research Institute to carry out a pilot dusting scheme of smallholdings in the Kegalla district during the 1955 refoliation season. The writer was, accordingly, requested by the Rubber Research Board to organise, carry out and report on the scheme, the principal objects of which were to ascertain the feasibility, costs and efficacy of sulphur-dusting under smallholdings' conditions, with a view to carrying out the work on a more extensive scale in future years.

Organisation

As there was hardly any response to press notices announcing a similar scheme last year, prospective owners in the Kegalla District were contacted by the distribution, through Rubber Instructors and other local bodies, of a leaflet-cum-application-form (Annexure 1), issued both in Sinhalese and English, explaining the proposed dusting scheme and inviting applications. At the request of the Rubber Controller, who was instrumental in obtaining the grant for this work, smallholders of under 10 acres were required to pay Rs. 20/- per acre towards the total cost of dusting and small-estate-owners of 10-50 acres Rs. 30/- per acre, all costs in excess of these being met by the grant of Rs. 20,000/-. The entire treatment of 5-6 dustings @ 12 lb. of sulphur per acre per dusting was to be done for this charge, including the supply of dusting-machines, sulphur, transport, labour and supervision.

The selection of small, scattered holdings for a trial scheme of this nature must be governed, within reasonable limits, by the situation and accessibility of each block and, for this reason, out of 233 applications received, comprising 535 acres, only 130 holdings (318½ acres) could be accepted for dusting. Of these, a further 40 per cent defaulted in making payment, leaving only 78 holdings consisting of 178 acres for final dusting. These were sorted into 3 "groups" in the Warakapola, Kegalla and Nelundeniya areas respectively and each group was further sub-divided according to acreage and situation into 5 sub-groups (except Warakapola which had to be divided into 6 sub-groups as there were too many for 5) so that the holdings in a sub-group were as many as could be dusted in one morning by one dusting machine between daybreak and 9 a.m. which is the time considered most suitable for sulphur-dusting. In two groups, therefore, there was dusting on 5 days of the week, the sixth day being left for making good any arrears caused by rain or other interferences, while in the 3rd group there was dusting on all 6 days.

Several owners who failed to pay after applying for dusting stated that, whilst being still keen on having the dusting done, they were unable to find the required

money and wanted the charge per acre reduced. Though there was general approval of the scheme, considerable inducement had to be used by the field staff to get owners to apply, also mainly on account of the charges being considered too high. Of the 233 applications received only 5 were from owners of over 10 acres, and of the 78 who finally paid only 3 were of this category. The size of holdings dusted varied from $\frac{1}{4}$ acre to 16 acres as follows:—

Holdings of $\frac{1}{4}$ acre	—	2 acres	57
,, ,, 2 acres	—	5 acres	16
,, ,, 5 acres	—	10 acres	3
,, ,, over 10 acres			2
			78

Of the 78 dusted holdings only 3 were ordinary seedling Rubber the balance consisting of budded areas. The elevation of the areas dusted was 350′-650′. The majority of the holdings were fairly steep in gradient, which, with the absence of dusting paths and motorable roads and the prevalence of weeds, rendered the work considerably more difficult and time-consuming.

3 Dusting machines, consisting of 2 Mistral IIA machines and one Noidium machine, were allocated to the 3 groups. One Mistral machine was kindly loaned free of charge by A. Baur & Co., Ltd. for the entire period of the trial, while the other two were purchased, the Mistral at Rs. 1,672/- nett and the Noidium at Rs. 1,396/50 nett. The 3 machines were in charge of 3 Rubber Instructors who had previously received the necessary training and personally conducted the dusting operations throughout. Their work was constantly supervised by the District Field Officer or Assistant Propaganda Officer under the directions of the writer who was present in person at various stages of the wrok. Transport of the machines and sulphur to holdings was done by 3 new vans (and drivers) kindly lent by the Department of Agriculture and each machine, during dusting, was carried by 4 labourers who were paid Rs. 2/75 each day, while a fifth carried the sulphur and acted as relief. Sulphur was transported from Colombo in consignments when the vans came for servicing and extra transport charges on this account were saved. Small local stocks were stored during dusting at the Rubber Depots at Kegalla and Warakapola by kind permission of the Rubber Commissioner, and drawn upon as required.

Dusting

A close watch was kept on the areas and the first holding that became ready (*i.e.* when about 10 per cent of the trees were just showing signs of bud-break after wintering) was dusted at Niyandurupola (Warakapola group) on 18th January in the presence of the Chairman of the Board, the writer and a number of interested smallholders. Further detailed instructions and demonstrations were given to the staff on this occasion on how dusting was to be done on different terrain and when exactly to commence, a well-timed start being an important factor in controlling the disease. By 22nd January dusting was commenced in a few holdings in the other two groups and more holdings in each group were brought under dusting as soon as the correct stage in refoliation was reached. Once started, dusting was continued on each holding at weekly intervals until about 90 per cent of the new foliage was suitably green and mature. Approximately 12 lb. of sulphur per acre per dusting were used and not less than 5 dustings were given to every holding. The majority actually received 6 dustings, according to the duration of refoliation, while one which had rather severe infection had 9 rounds including one mid-weekly dusting.

The average quantity of sulphur used for the entire trial was 69 lb. per acre. In the Warakapola area dusting started on 18th January and terminated on 7th March, the number of dusting days being 37. In the Nelundeniya and Kegalla areas dusting started on 22nd January and terminated on 17th and 26th March respectively, the number of dusting days being 31 and 39 respectively. The actual extents dusted in the 3 areas were as follows:—

			Ac.	*Rd.*	*Per.*
Warakapola area ...	35 holdings comprising		69	0	35
Kegalla „ ...	24 „	„	65	2	00
Nelundeniya „ ...	19 „	„	43	2	25

Weather and Oidium Incidence

On the whole very favourable dusting weather prevailed throughout the trial, which lasted 2¼ months from the commencement of the first holding to the termination of the last, there being not a single interruption of dusting by rain. Considering the fact that the trial covered 78 holdings spread out over a fairly wide area, the overall dusting duration of 2¼ months suggests that wintering this year was not prolonged at least in the district concerned, as compared with a similar trial over a wider area in the Kandy and Matale districts in 1936 where dusting had to continue for 4 months. This is probably due to the majority of dusted areas in the present trial being budded ones. Up to a mid-way stage the weather was dry but thick early morning mists and evening showers set in thereafter, which brought on a conspicuous worsening of infection which till then had remained fairly mild. On the whole, oidium in this district this year was about the same as last year, but not as bad as during the worst years.

Generally speaking oidium was distinctly more severe on ill-nourished, badly tapped, old seedling plantations than on budded Rubber.

Staff set out for work by daybreak and dusting continued each morning from 6 a.m. to 9 or 9-30 a.m. Practically no wind prevailed during the early hours but light breeze developed at about 7-30 or 8 a.m. which was found ideal for wafting the dust through the canopies.

Results and Observations

The conclusion of the trial showed a marked difference in foliage in regard to freedom from oidium in most dusted holdings as against neighbouring undusted Rubber. A number of these were seen by the new Chairman of the Board and the Director who made an inspection tour of the Kegalla and Nelundeniya areas on March 29th and expressed satisfaction with the results obtained. A large proportion of the dusted areas, especially those which wintered early, had no leaf-fall at all caused by oidium, although slight spotting of the now-mature leaf-blade, which in itself is not harmful, was sometimes evident. Those which wintered late and caught the full force of the more severe infection which developed towards the latter part of February, suffered slight leaf-fall, but in almost all cases both leaf-fall and serious damage to unshed leaves were unmistakably greater on undusted holdings.

Owners personally met by the writer were now confident of the benefits of dusting which, they declared, were beyond their expectations in several cases. To obtain a general expression of opinion, a questionnaire (Annexure 2) was sent to all 78 owners direct and the replies received by the writer direct from 74 are summarised

in Annexure 3. All 74 affirm that oidium is less on the dusted trees, of whom 20 say it is entirely absent and 40 others say that 75-90 per cent of the dusted holding is free of it. 25 out of the 74 have had no leaf-fall, while a further 37 have had only 5-20 per cent of leaf-fall; as against 35 (out of 74) who say there has been over 75 per cent leaf-fall plus another 25 who have had 25-75 per cent leaf-fall on near-by undusted areas. 53 say that oidium was as bad this year as in previous years, while 5 say it was less bad and 16 do not answer. Almost all are agreed that the dusting was well done and they would like their areas dusted next year. Although reliance cannot be placed on the absolute accuracy of these answers, they indicate that some definite benefit has been derived and that, in spite of the Rs. 20/- and 30/- per acre paid, they have no serious complaints to make. Annexure 4 is an unsolicited letter received with his answer to the questionnaire from an educated Buddhist Priest, two of whose lands were dusted.

Costs

The actual costs of the dusting trial are shown below. In considering them due regard should be given to the remarks that follow. The total acreage dusted has been taken as 178.

	Total Cost	*Cost per Acre*
Supervision		
1. 50 per cent of District Field Officer's present salary with dearness, special and rent allowances	713.95	
2. 50 per cent of 3 Rubber Instructors' present salaries with dearness, special and rent allowances	791.63	8.46
3. Actual travelling of District Field Officer (1,178 miles) @ -/37 and 3 Rubber Instructors (474 miles) @ -/19 cts..	525.92	2.95
Equipment		
1. 1/6 of nett cost of 2 Mistral IIA and 1 Noidium dusting machines	790.08	4.44
2. Dusting sulphur—112 cwt. @ 500/- less 5 per cent	2,660.00	14.94
3. 4 pairs goggles for staff and 13 eye-shields for labourers	27.18	.15
Transport		
1. 3 Temporary Drivers' Salaries and allowances @ Rs. 6/- per day, for actual duration ...	857.72	4.82
2. Petrol and oil for 3 vans and 3 dusting machines	765.53	4.30
3. Construction of 2 temporary sheds for garaging vans at Warakapola and Nelundeniya ...	31.55	.18
Total Carried Over to next Sheet ...	7,163.56	40.24

	Total Cost	Cost per Acre
Brought Forward from Sheet No. 3 ...	7,163.56	40.24
Labour		
Labour for carrying dusting machines and sulphur 514 man-days @ Rs. 2/75 ...	1,413.50	7.94
Miscellaneous		
1. Printing of leaflet—5,000 copies	90.00	.60
2. 3 Galvanized buckets, 2 dusters, vulcanising tube, etc.	15.95	
Total ...	8,683.01	48.78

Only half the actual salaries and allowances presently drawn by the 4 Rubber Research Institute officers in charge of the trial has been debited as a fair charge against this work, because they also attended, though only to a small extent, to some of their other duties as Rubber Instructors after finishing dusting work by 11 a.m. or so. Moreover if staff was to be recruited for this work, it is unlikely that they would be paid salaries as high as those drawn by the officers concerned, namely Rs. 550/- per month (including allowances) for the District Field Officer and Rs. 300/- for each Rubber Instructor. Salaries have been charged only for the actual period of dusting of each officer.

Only the actual mileage of each officer has been charged. The 3 Rubber Instructors travelled almost entirely in the vans and incurred no expenditure except one who had to travel 14 miles daily from his quarters to the van and back. This item, therefore, mainly comprises the District Field Officer's car mileage for visiting the dusting areas almost daily. This supervision is an essential requirement for this work.

The drivers for the 3 vans were recruited by the Department of Agriculture on a daily wage basis and had to be paid the prescribed wage and allowance of Rs. 6/- per day each, which is considered an unnecessarily high expenditure and has cost nearly Rs. 5/- per acre dusted. It is understood that they are claiming over-time in addition, for their work at Kegalla. They were only on duty from about 5-30-10-30 a.m. on dusting days. Employment of monthly-paid drivers or other cheaper forms of transport altogether should be considered for the future.

The somewhat high cost of drivers has, however, been offset by the vans being supplied entirely free except for the actual cost of petrol and oil and servicing trips to Colombo.

Labour is one of the 3 principal items of cost but is unavoidable. The work is arduous, especially on smallholdings that are often steep and pathless, and an attractive wage has to be offered if a regular turn-out is to be expected.

2 Temporary cadjan sheds were erected for housing 2 of the vans and the 3rd was kept at the District Field Officer's residence.

Although only 2 machines were actually paid for, the cost of all 3 has been debited and depreciation worked out over a period of 6 years.

In considering costs for dusting smallholdings, it must always be noted that allowance should be made for considerable variation according to situation, distance apart between holdings, size, etc. which do not arise in dusting large estates.

Conclusion and Comments

It is the writer's duty to point out that the results of the trial have been convincing, but conscientious and thorough work and careful supervision are essential factors to make it so. In the absence of these, much money could be, and often is, wasted by blowing sulphur into the air without hardly 20 per cent of the trees actually getting it. Experience and knowledge are very necessary. If large sums of money are to be spent on dusting in the future, necessary precautions should be taken against waste. Dusting of smallholdings is a much more difficult problem than dusting large estates.

The question of groups of owners forming co-operative units and doing their own dusting should be considered. Machines and sulphur could be supplied by Government on suitable terms while owners must provide the transport and labour.

Possibilities of importing cheaper dusting machines and sulphur should be explored. Machines could be made locally if the engines are imported. Large quantities of machines should not be bought unless previously tried out at least over a full season's dusting.

In a previous trial carried out in 1936, dusting was done throughout the day and consequently more areas were dusted per day and costs were less.

Both makes of dusting-machines used gave satisfactory results throughout the trial. The Mistral, though slightly more expensive, had the advantage of being 20 lb. lighter and the flexible funnel was very useful in directing the sulphur where you want it even while the machine is being carried. It's handles could be adjusted to enable 2 or 4 men to carry the machine. In narrow paths and along bunds on fields this is an advantage as it is easier for 2 men to carry the machine than for 4. The Noidium engine, however, was slightly more powerful and able to send the sulphur to the tallest trees, though the height reached by the Mistral was sufficient for all normal purposes. In the Noidium, when the petrol tank was full, petrol tended to leak from the opening in the tank cap due to vibration.

Thanks are due to the field officers concerned who did a good job of work, often under trying conditions.

Annexure 1

TRIAL SULPHUR DUSTING SCHEME KEGALLA DISTRICT

It is proposed to carry out a trial scheme for Sulphur-dusting rubber small-holdings and small-estates against Oidium in certain selected areas in the Kegalla District during the dusting season, December 1954 to March 1955. Government will bear part of the cost of the scheme by meeting the cost of the purchase of dusting machines for this purpose, supervision, transport, etc. Owners are expected to contribute at the following rates towards the total cost of the scheme:—

Small-holders owning under 10 Acres ... Rs. 20/- per acre

Owners of small estates between 10 to 50 Acres ... Rs. 30/- per acre

The above rates are for the **complete** treatment, which will normally consist of 5 to 7 dustings, given at weekly intervals, at 12 lb. of Sulphur per acre per dusting.

Owners who wish to have their estates/small-holdings dusted at the above rates should inform the Small-holdings Propaganda Officer, P.O. Box 901, Colombo before September 30th, 1954, giving the name and address of the estate or small-holding, its registered number under the Rubber Control Ordinance, the acreage to be dusted, whether the area to be treated can be reached by motor vehicles or not, whether it is flat or hilly, etc.

The scheme will materialise only if sufficient applications for sulphur-dusting are received. No guarantee can be given that every estate or small-holding desiring to participate in the scheme will be dusted, as the scheme is on an experimental scale and must necessarily be confined to a compact area.

Three dusting machines will operate in three suitably situated groups of estates or small-holdings, but it would not be practicable to dust areas that are inconveniently far from such groups. The demarcation of such groups will be made according to the applications received, and the owners will be duly informed of the areas selected for sulphur-dusting by October 15th, 1954.

W. I. PIERIS,
Small-holdings Propaganda Officer,
Rubber Research Institute,
P.O. Box 901,
Colombo.

6th September, 1954.

.....

To be torn off and sent to reach S.H.P.O., P.O. Box 901, Colombo,
before 30th September, 1954.

APPLICATION FORM

I wish to have my estate/small-holding sulphur-dusted. Particulars of the land are given below.

I am prepared to pay for the complete treatment at the rates stated in your handbill dated 6th September, 1954.

1. Name and Address of Owner:.....

2. Registered No. of Land under the Rubber Control Ordinance:.....

3. Name of Land:..... 4. Acreage to be dusted:.....

5. Situation (Village and District):.....

6. Lie of Land (whether steep, hilly, undulating or flat):.....

7. Distance to land from nearest town and whether land can be reached by motor vehicles; if not, state how many miles it is necessary to walk .....

.....

Date..... Owner's Signature.

Annexure 2

19*th March*, 1955.

TRIAL SULPHUR-DUSTING SCHEME, KEGALLA.
QUESTIONNAIRE SENT TO ALL OWNERS OF DUSTED HOLDINGS

1. From your own experience of this year's dusting, does the foliage of your dusted trees show less Oidium than foliage of neighbouring undusted trees?

   Answer:—

2. Is the dusted foliage entirely free of Oidium or partly free, and if the latter to what extent?

   Answer:—

3. Is there any leaf-fall of dusted foliage and to what extent?

   Answer:—

4. Is there any leaf-fall of undusted foliage and to what extent?

   Answer:—

5. Is the foliage in undusted areas as badly infected with Oidium this year as in previous years?

   Answer:—

6. How many dustings did your land receive and was the work properly carried out by the dusting officers?

   Answer:—

7. Would you like dusting to be done in future years also?

   Answer:—

   (*a*) Name and Address of Owner

   (*b*) Application Number:—

   (*c*) Name of the Land and Acreage

.....
Signature of Owner.

SUMMARY OF REPLIES TO THE QUESTIONNAIRE

Number of holdings dusted—78

Number of replies received—74

	Question	*Answer*
1.	Do the dusted trees show less oidium?	All 74, yes
2.	Is the dusted foliage entirely free from oidium or partly free?	Entirely free — 20; 75 to 90% free — 40; 50 to 74% free — 23; Not Answered — 1
3.	Is there any leaf fall of dusted foliage?	No leaf fall — 25; 5 to 20% leaf fall — 37; 20 to 40% leaf fall — 11; Not Answered — 1
4.	Is there any leaf fall of undusted foliage?	75% and over leaf fall — 35; 50 to 75% leaf fall — 5; 25 to 50% leaf fall — 20; Less than 25% leaf fall — 1; Not Answered — 13
5.	Is the undusted foliage as badly infected as in previous years?	Yes — 53; Less Badly — 5; Not Answered — 16
6.	Number of dustings given.	5, 6 and 7 dustings — 72; 3 dustings — 2(?)
	Was the work done satisfactorily?	Satisfactory — 50; Very Satisfactory — 19; Not Answered — 3; Some trees not properly dusted — 2
7.	Do you wish dusting to be done next year?	Yes — 73; Not Answered — 1

Annexure 4

TRANSLATION

"Meedeniya Temple",
Hettimulla.
23-3-55.

Dear Sir,

I am very glad to inform you that the Trial Sulphur-Dusting Scheme inaugurated in this year has very satisfactory results. It is quite distinctly seen that the undusted rubber lands in this area are very badly infected with Oidium whereas my sulphur-dusted rubber lands as well as the neighbouring dusted lands have no signs of Oidium at all. The smallholders who could not take part in this campaign are now repenting when they see the healthy conditions of the sluphur-dusted lands.

I take pleasure to state that the success of this Scheme was mainly due to the keen interest taken by the supervisory officers. Our grateful thanks are due to him, whoever sympathised with smallholders and originated this Scheme. Also we hope this successful Scheme inaugurated by him, will be deservingly appreciated by the Government.

I am very glad to have my lands sulphur-dusted in the future years also.

Yours faithfully,
Sgd. M. Wimalananda Thero.

REMARKS ON NATURAL RUBBER*

By

Dr. J. G. J. A. Maas

(Text of an address delivered to the Planters' Association and Low Country Products Association of Ceylon at the Chamber of Commerce, Colombo, on the 4th August, 1955).

CEYLON

General Position

What is, in a nutshell, the general position of natural rubber? Most of you know this as well as or better than I do, but reviewing it may make a good starting point.

Before the war practically all the new rubber was natural rubber and 97 percent of it came from S.E. Asia.

During and after the war there was a gradual development of natural rubber cultivation outside S.E. Asia.

Although we have heard the slogan of the return of Hevea rubber to South (and middle) America, the extension there is not very great up to the present. The main reason for this small progress in the Americas is the presence there of South American leaf disease (Dothidella). I want to say immediately that it is necessary that the countries in S.E. Asia must:

(*a*) co-operate in preventing the introduction of Dothidella in those countries,

and (*b*) co-operate in breeding high yielding and disease resistant planting material.

I will return to this subject later.

Research carried out in South and Middle America during and after the war makes it possible to grow Hevea on estates in spite of South American Leaf Blight but it is not easy to grow non-resistant high yielding trees to the size at which they can be crown-budded with resistant tops at a height of for instance $2\frac{1}{2}$ metres. The better but longer way is to breed resistant high yielding material. There has been some success already in this direction but the highest yields of resistant crosses and clones is still lower than that of the selected high yielding material here in S.E. Asia. The disease and the planting material are not however the only problems in the American natural rubber producing industry. I think therefore that we will be able to compete with S. America.

There are however other countries, especially in Africa, where there is no Dothidella and where successful rubber cultivation is possible and is expanding now.

**The Rubber Research Institute of Ceylon welcomes papers on subjects of general interest from outside contributors but does not accept any responsibility for the views expressed therein.*

Far more important for us in S.E. Asia as regards the future of the natural rubber industry is the development of the synthetic rubber industry during and after the war. This is our most dangerous competitor. The best we can hope for, is that the synthetic and the natural rubber industries will co-exist as complementary producers. I think this will be possible, provided we use all the opportunities that research has brought us already and can bring us in the near future; in other words, provided that we use the tools that we have.

I cannot stress too much the need for your special attention to the necessity for international co-operation in the field of research. It is of the utmost importance—it is essential—and I will congratulate you on your aggressive replanting programme —A few figures will illustrate the position:—

Of the present day natural rubber production 93 per cent still comes from S.E. Asia. The percentage produced in Africa is gradually growing.

However, to-day nearly 40 per cent of new rubber production is synthetic rubber as against 25 per cent five years ago and practically nothing before the war. The leading synthetic rubber producing country is the U.S.A. Let us see what happens there? Five years ago a little over 40 per cent of the new rubber consumption was synthetic rubber; now it is about 60 per cent. This is a dangerous trend. Synthetic rubber probably will remain the most important product in the United States and the industry in Europe must follow the same course in using and producing synthetic rubber, to a larger extent than is done at present, in order not to lose experience and its competitive status.

This does not look very hopeful. Still we need not be down-hearted as long as we keep up our fighting spirit.

The principal reason is that the world's consumption of new rubber is growing very fast and now we have to grasp our share in the expansion.

As long as more natural rubber is used, it is of equal importance to all of us no matter in what form the product is bought. Liquid latex production has nearly doubled in the last few years. This is not to the benefit of the latex producers only, but to all rubber producers as the greater volume of latex is used for new and expanded uses and there is no longer competing with other forms of natural rubber.

If we find ways for new uses of the lower grades of rubber, it will also be to the benefit of producers of higher grade rubber. There seems to be new possibilities in this field now appearing.

As I told you already, our hope lies in the growth of new rubber consumption *i.e.* in the extension of uses for rubber.

The world's natural rubber production amounts to about 1,850,000 tons. The world's synthetic production capacity, outside Russia and its satellites, and not including the alcohol butadiene standby factories in U.S.A. with its too high cost price in normal times—is nearly 1,000,000 tons.

Together this amounts to a little more than the total 1955 consumption but in a few years a shortage is expected, as consumption is growing very fast especially outside the U.S.A. where consumption is very high already.

An expansion of synthetic rubber production is to be expected to meet this future shortage and this can be achieved quicker than can the expansion of natural rubber production. However we must try to obtain our share of the expanding market.

As far as rubber consumption is concerned Western Europe is quickly following the historical trend of rubber consumption in U.S.A. and therefore may become of very great importance to the natural rubber producers.

We have to try to compete with synthetic rubber, especially outside the U.S.A., on price and quality. It will be difficult to produce tailor-made varieties of natural rubber for different uses as the synthetic rubber industry is doing. It can be done to a certain extent. But surely we can improve our product by making clean general purpose natural rubbers and we could offer large quantities of all grades of greater uniformity than we offer today.

Threatening new developments in the synthetic rubber industry are probably coming. Since the synthetic rubber industry in the U.S.A. went over to private control the aggressive research already existing certainly will not be less than it is now. Some of us think it is hopeless to compete. If we take this attitude and hang our heads we are lost already. And I think that the synthetic rubber industry does not intend to kill the natural rubber industry, but it does perhaps expect that we make full use of our possibilities and that we make a good product and sell it for a low and competitive, and if possible, more constant—price and still make a reasonable profit.

I never believed that the official synthetic rubber prices were really too high. They were perhaps in the years of development, they will not be for the future and they are going to influence and even regulate the price at which we have to make our natural rubber.

Some remarks on breeding C.A.

It is fortunate that so much breeding and selection of Hevea brasiliensis, which is a long term work, has already been done and that the present results have been attained before today's development of synthetic rubber. At present we can produce per acre 3 to 4 times the amount of rubber that was produced when the breeding work started 35 years ago. Higher yields per acre can make it possible for us to produce at a lower price and to compete. It is in the technical field that at present the most important factor now exists. The producing countries have to be careful that this possibility is not outdone by other developments.

I have heard the opinion expressed that we have now come to a standstill in breeding possibilities. Although it is most important to use in practice the results that we have already reached, I regret the above mentioned opinion because it may influence the research work on production and, originally being a selectionist and agriculturist myself, I am sure that we have not yet reached the possible limits in that regard. More, we are at the beginning of a new period of fundamental production research, too little of which is being done at present. Most of the work done at the experiment stations concerns the testing of a number of clones in different countries and under different circumstances. This is certainly of primary importance and deserving priority, but should only be classified as development work and not the final limit of research.

Although Ceylon is not one of the main producing countries, I congratulate the Rubber Research Board and the Director of the Rubber Research Institute and his

co-workers for what they are contributing to the breeding work of Hevea brasiliensis. They are certainly doing more than their share in this field.

In nature everything is not produced ready made for us, but we have our brains with which to devise ways of using nature's possibilities. We, on the side of the natural rubber producers, must run nature's natural rubber factory inside the Hevea tree and compete with man-made synthetic rubber factories, where the chemists—also studying natural phenomena—are building up rubber from simple elements in the same way as the rubber tree is doing inside its latex tubes. To a high degree the resulting products are similar in properties.

We now have available a number of high yielding clones and high yielding selected seedling families. We have obtained more or less equal results in the different producing countries, for instance in Indonesia, Malaya, Indo-China and Ceylon. It is remarkable that a number of the highest yielding clones are good yielders in different countries, in countries with dry seasons and countries with more evenly distributed rainfall, at sea level and at a height of a few hundred metres. Others are less suitable for certain areas and, in a number of cases, not because the production capacity itself is disappointing but for instance because there is more wind damage in some areas or more mildew—as in Ceylon—and so on. This proves at the same time that very often we have not yet obtained an ideal combination of characters and it is one of the important tasks of further selection and breeding work to improve the combinations of properties in new planting material.

Last year there was an interchange of a very large number of the best clones between the above mentioned four countries, so that nearly 100 clones are now available to be tested in each country. This is a hopeful sign of international co-operation between rubber producers.

At present yields of 2,000 kilogrammes per hectare or 2,000 lb. per acre are obtained. Does this mean the end of yielding possibilities from a theoretical point of view? I don't think so.

The total production of dry matter per acre, including rubber, is, even in those high yielding areas, not so extremely high. The production starts with the production of assimilates by the leaves. They are transported through the trees and broken down, then partly used to build up rubber in the latex tubes (and to regenerate rubber in those tubes after tapping) and partly to build up woody tissues and other material. Therefore it is understandable that tapping influences the growth of the tree.

For the building up of dry matter and rubber a certain amount of water is needed and there are regions that are too dry for the highest production to be possible.

We must try to grow trees with a high assimilation capacity and a healthy foliage. The control of mildew—perhaps the most serious disease in parts of your country, is certainly of much importance and much attention is rightly paid to this by the experiment station in Ceylon. Prevention is always better than control and I saw with great pleasure that in recent years, in Ceylon more than elsewhere, much breeding work has been done to combine the properties for high yield with those for mildew resistance using a clone produced by myself thirty years ago as one of the parents (*i.e.* clone LCB. 870).

Taking away 2,000 lb. of rubber per acre per year does not only mean that this rubber has to be built up in the tree, but also that by the process of tapping the tree,

other valuable substances are extracted, vital nitrogen for instance. All this has to be compensated for and manuring is becoming more necessary on high yielding plantations than it was on low yielding ones. For other reasons also however many of your soils need manuring.

The clones with genetic properties for high yield will give their highest production only when there are optimal growing conditions. Although it was possible to grow the old non-selected material practically everywhere, it will not be advisable to replant everywhere with the high yielding clones that are now available. Modern rubber cultivation will remain more and more on the better soils and in the better climates. As long as the soils are deep enough and there is a good water supply they need not be chemically rich. Those soils can be restored by manuring and green manures. When the soils are not deep the root development will be less and the natural formation of nitrogen compounds in the soil lacking. Manuring with nitrogen may give good results, and other agricultural methods can be taken to counteract the influence of the shallow soil, which may be shallow from different causes. When you do not have an ideally distributed rainfall and perhaps rather too long a dry period, it does not mean that nothing can be done to improve the growing conditions.

When we say that under good growing conditions 2,000 lb. of rubber per acre can be made, must this be regarded as a maximum, must we really accept the view that selection has come to a standstill, so that further work is not urgently needed?

I have told you already that the best clones available at present have not yet the ideal combination of properties. Some of them have a rather disease susceptible bark, many of them show wind damage, most are insufficiently resistant to mildew and—we will have to grow high yielding clones resistant to Dothidella to prevent disaster if Dothidella should come to the East.

Many of the now recommended clones are what we call primary clones made from high yielding mother-trees found in the old non-selected areas. They are already being gradually replaced by new clones derived from family crosses. We will breed new clones with better yielding capacity and better combination of properties.

Having certain clones it is not yet certain that those natural rubber factories are giving us at present their maximum production.

The use of yield stimulants is a complex problem. Can we influence inside the tree the formation of rubber and of other substances and tissues in the direction of producing more rubber, and at the same time preventing harm to the tree?

And what about the stock-scion relationship and the scion-crown relation?

It was an idea and an ideal of the late Prof. P. J. S. Cramer that each clone should be budded on its best stock and its best crown should be budded on top.

The best stock does not mean that it is best to bud a clone on its own seedlings, although this relationship seemed to be an advantage in some cases.

As a rule we use good growing and good producing seedlings as stocks and a small number of seedling families seem to be universally good and even better than the seedlings of the clones itself.

But I invite your attention to the following example, which I have mentioned in a book, although I have never published the detailed results of the experiment.

On the Government estate Socbah in Java we placed a few clones on ten different stocks. The greatest difference that I found, measuring the production over three years, is as follows.

Clone Tjir. 1 produced its highest yield on seedlings of LCB. 850 and LCB. 856 and yielded on those stocks 17 per cent. more than on LCB. 828 seedling stocks.

Clone BD 5 showed exactly the opposite, the yield was best on LCB. 828 and worst on LCB. 850 and LCB. 856; the difference was 10 per cent.

What is the difference between the clones Tjir 1 and BD 5—on those stocks. Agricultural research is not finished, although in many experiments we do not find a very great influence of the stock, and this experiment shows that we must take the stock into consideration when we prepare clone testing experiments.

And what about the top- or crown buddings? Our knowledge is insufficient.

The influence of tapping extends over a much larger area of the tree than was expected in the past. It has been proved in certain experiments that, making top-buddings on a height of 1 m, the production capacity of the crown influences or even determines the production of the intermediate stem. Those discouraging results were generalised too much and retarded other experiments for many years. The influence of the crown diminishes when you are tapping farther away from the junction. Will the influence be practically excluded when the top-buddings are made high enough, for instance at three metres? It seems to be so, at any rate to a large extent, and if so, it may be possible to use for tops clones not having the highest production, but having other desirable qualities, for instance resistance to leaf-disease, resistance to dry periods, crowns with shade resistant leaves, crowns with less wind-damage, crowns that will stand the dry season better, crowns which form a large amount of assimilates and therefore can stimulate the growth of the intermediate stem. Can the better supply of the assimilates produced by a particular crown be transformed into better rubber production by the individual properties of the intermediate stem or is the high yielding capacity of the crown itself needed? And when the shape of the intermediate stem is influenced by the crown, can that be of any importance for the tapping systems?

To those questions, more questions can be added. This proves that scientific research is not yet finished with this problem.

I have stressed the importance or research, of fundamental research, not overlooking the importance of advisory service in any way.

I think that insufficient fundamental research in the field of consumption and in the field of production is done at the moment. I also think that international co-operation and co-ordination can be improved. Personally I am not in favour of rigid regimentation and think that the best results can be obtained with co-operation and co-ordination in freedom.

Although research is so sorely needed now, we have recently seen serious disagreements, indecision, and delay in this, in Malaya and in England and in Indonesia. I understand that this is not in the first place a matter of valuation of research and I therefore hope and expect that by restudying the organisation and co-operation we will find the way out and perhaps we can improve on what existed before.

Seeing what your country meant in the beginning of rubber cultivation in the East and what you are doing at present, I hope and expect that Ceylon will study the problem of the pace and scope of international co-operative research and contribute its share to the common pool of our advancement and thus help to ensure the survival of the natural rubber industry.

RUBBER RESEARCH INSTITUTE OF CEYLON.

Minutes of the 137th meeting of the Rubber Research Board held at the Rubber Controller's Office, Colombo, at 2-30 p.m. on Wednesday 17th August, 1955.

Present:—Mr. S. Pathmanathan (in the Chair), Mr. H. St. J. Cole Bowen, Mr. W. P. H. Dias, J.P., Mr. G. H. Dulling, Mr. Errol Jayewickrema, Dr. A. W. R. Joachim (Director of Agriculture), Major T. F. Jayewardene, M.P., Mr. B. Mahadeva (Rubber Controller), Mr. R. H. Wickramasinghe (Deputy Secretary to the Treasury), Senator C. F. W. Wickramasinghe, Dr. H. E. Young (Director) and Mr. C. D. de Fonseka (Administrative Secretary).

1. Minutes:

(*a*) *Confirmation.*—Draft minutes of the meeting held on 18th May, 1955, which had been circulated to members, were signed by the Chairman.

(*b*) *Matters arising from the Minutes:*

1. *Sulphur dusting scheme for smallholdings.*—The S.H.P.O's proposals for a sulphur dusting scheme for smallholdings on a co-operative basis in 1956 using 12 dusting machines to be supplied by Government were approved and the S.H.P.O. was asked to proceed with the formation of three of such groups in each of four suitable districts. It was agreed that middle class estates (*i.e.* 30 to 100 acres) may be taken into the scheme if a sufficient number of smallholders are not available to form the necessary co-operative groups.

2. *Re-engagement of Director.*—The Chairman reported that Dr. H. E. Young, Director, had expressed his intention not to accept re-engagement on the expiration of his present contract. He was requested to bring this matter up for consideration at a later meeting after discussing the matter with Dr. Young.

3. *Experimental Committee.*—The recommendations made by the Committee at its meeting of 4th August, 1955 were approved.

4. *Smallholdings Dept. Selection Committee.*—The recommendations made at meetings held on 11th July, 1955 and 19th and 20th July, 1955 were approved.

2. Reports and Accounts:

(*a*) *Receipts and Payments accounts for the 1st and 2nd Quarters* 1955 were approved.

3. Staff:

(*a*) *Research Asst. Agro. Dept.*—The progress report for February to June 1955 of Mr. A. J. Jeevaratnam, Research Asst. Agro. Dept., who is under training at the Waite Agricultural Research Institute, Australia, was tabled and it was noted that this officer's progress was satisfactory.

(*b*) *Asst. Staff Association.*—At the request of the Asst. Staff Association Rule 5(iv) of the R.R.I.C. Provident Fund was amended to provide for a member quitting the

service of the Board by voluntary resignation after giving the notice required by the terms of his appointment to receive the Board's contribution up to the last date of the month in which the member hands in his resignation.

(*c*) *Staff Club.*—In view of a request made by the R.R.I.C. Staff Club it was agreed that the annual grant to the Club be increased with effect from 1956.

4. Development of Crown Land in Commercial Crops:

In connection with a request made by the Land Commissioner it was agreed that officers of the Institute may inspect and report on the suitability for rubber planting of certain lands in Kalutara, Ratnapura and Badulla districts which the Government proposes to alienate to peasants for planting rubber.

5. London Advisory Committee:

Draft minutes of the 62nd meeting of the Committee and 7th meeting of the Agricultural Sub-Committee were tabled.

6. Publications:

The following publications were tabled:—

Annual Report for 1954.

First Quarterly Circular for 1955.

Advisory Circulars No. 52 and 53.

7. Next Meeting:

It was agreed that the next meeting of the Board be held at 2-30 p.m. on Monday 12th September, 1955.

8. Plant Pathologist:

Applications for the post of Plant Pathologist were considered and it was agreed that the London Advisory Committee be asked to arrange for a Selection Committee to interview two applicants. Mr. G. H. Carter a member of the Board at present on leave was co-opted to the Selection Committee.

The meeting then terminated.

RUBBER RESEARCH INSTITUTE OF CEYLON

Minutes of the 138th meeting of the Rubber Research Board held at the Head Quarters of the Planters' Association of Ceylon, Steuart Place, Colombo, at 2-30 p.m. on Monday 12th September, 1955.

Present:—Mr. S. Pathmanathan (in the Chair), Mr. H. St. J. Cole Bowen, Mr. W. P. H. Dias, J.P., Mr. Errol A. Jayawickrame, J.P.U.M., Dr. A. W. R. Joachim (Director of Agriculture), Mr. B. Mahadeva (Rubber Controller), Senator C. F. W. Wickramasinghe, Dr. H. E. Young (Director) and Mr. C. D. de Fonseka (Administrative Secretary).

Mr. G. H. Dulling and Mr. R. H. Wickramasinghe (Deputy Secretary to the Treasury) had intimated their inability to be present.

1. Director:

It was reported that Dr. H. E. Young, Director, had expressed his intention to return to Australia on the termination of his present contract on 6th October, 1955. The Board expressed its appreciation of the valuable services rendered by Dr. Young during his period of office and decided that the post of Director be advertised immediately as widely as possible.

Mr. C. A. de Silva, Botanist, was appointed Acting Director with effect from 6th October, 1955 in addition to his own duties as Botanist.

Mr. O. S. Peries, Technical Assistant to the Director, was confirmed in his appointment and appointed Acting Plant Pathologist with effect from 6th October, 1955.

2. Plant Pathologist:

In accordance with the recommendation made by the London Advisory Committee, Mr. A. Riggenbach M.Sc. was appointed Plant Pathologist and it was noted that he would be available in November 1955.

3. Visiting Agent:

Mr. C. A. C. Bowen was appointed Visiting Agent for Dartonfield Group.

4. Next Meeting:

Agreed that the next meeting of the Board be held at Dartonfield at 2-30 p.m. on 22nd September, 1955.

RUBBER RESEARCH INSTITUTE OF CEYLON

Minutes of the 139th meeting of the Rubber Research Board held at Dartonfield, Agalawatta, at 3 p.m. on Thursday 22nd September, 1955.

Present:—Mr. S. Pathmanathan (in the Chair), Mr. H. St. J. Cole Bowen, Mr. G. H. Dulling, Mr. Errol Jayawickrema, Dr. A. W. R. Joachim (Director of Agriculture), Mr. B. Mahadeva (Rubber Controller), Dr. H. E. Young (Director) and Mr. C. D. de Fonseka, (Administrative Secretary).

An apology for absence was received from Mr. R. H. Wickramasinghe (Deputy Secretary to the Treasury).

Mr. C. A. de Silva, Botanist, was present by invitation.

1. Minutes:

(*a*) *Confirmation.*—Draft minutes of the meetings held on 17th August and 12th September, 1955, were signed by the Chairman.

(*b*) *Matters arising from the Minutes:*—

1. *Plant Pathologist.*—It was reported that Mr. A. Riggenbach had accepted the appointment and would be available in November 1955.

2. Administrative Committee:

Recommendation made at the meeting held on 22nd September, 1955.

Improvement of Peons' Quarters.—The Committee's recommendation that one quadruple cottage and two double cottages at Dartonfield be improved in accordance with the estimate submitted by the Estate Superintendent was approved and a supplementary vote of Rs. 2,000/- was passed in order that the work may be done within the current year.

3. Staff:

Changes in Assistant Staff since the last meeting were reported and approved.

4. Estate Superintendent:

Mr. L. Wijeyagunawardena was confirmed in his appointment as Estate Superintendent with effect from 17th September, 1955.

5. Assistant Plant Breeder:

It was agreed that applications be called by advertisement for the post of Assistant Plant Breeder on the salary scale Rs. 360–25–710 per month and on the terms of service applicable to Intermediate Staff. Applicants should be University graduates in agriculture possessing at least a 2nd class honours degree.

6. Next Meeting:

It was agreed that the next meeting of the Board be held in Colombo at 2-30 p.m. on Monday 24th October, 1955.

The meeting terminated at 4-15 p.m. with a vote of thanks to the Chair proposed by Mr. Cole Bowen.

RUBBER RESEARCH INSTITUTE OF CEYLON

Minutes of the 140th meeting of the Rubber Research Board held at the Head Quarters of the Planters' Association of Ceylon, Steuart Place, Colombo, at 2-30 p.m. on Monday 24th October, 1955.

Present:—Mr. S. Pathmanathan (in the Chair), Mr. D. C. L. Amarasinghe (Acting Rubber Controller), Mr. H. Cole Bowen, Mr. W. P. H. Dias, J.P., Mr. G. H. Dulling, Mr. Errol Jayawickreme, J.P., Major T. F. Jayewardene, M.P., Dr. W. R. C. Paul (Acting Director of Agriculture), Mr. W. J. A. Van Langenberg (Acting Deputy Secretary to the Treasury), Mr. C. A. de Silva (Acting Director) and Mr. C. D. de Fonseka (Administrative Secretary).

1. Board:

The Chairman reported the following changes in membership and welcomed the new members to the Board:—

(*a*) Dr. W. R. C. Paul, Acting Director of Agriculture, would serve on the Board in place of Dr. A. W. R. Joachim who was on leave from 1st October, 1955 until mid January, 1956.

(*b*) Mr. W. J. A. Van Langenberg, Acting Deputy Secretary to the Treasury, would serve on the Board in place of Mr. R. H. Wickremasinghe who was on leave from 16th September until 29th October, 1955.

(*c*) Mr. D. C. L. Amarasinghe, Acting Rubber Controller, would serve on the Board in place of Mr. B. Mahadeva who was on leave from 6th October, 1955.

2. Minutes:

Draft minutes of the meeting held on 22nd September, 1955, which had been circulated to members, were signed by the Chairman.

3. Administrative Committee:

The recommendations and resolutions made by the Committee at its meeting of 22nd September, 1955 were approved.

4. Reports and Accounts:

(*a*) *Research Programme for* 1956—*was approved.*

(*b*) *Estimates of Income and Expenditure for* 1956—Draft estimates providing for income and expenditure as follows were considered and approved:

Estimated income			Rs.	1,474,920
Estimated expenditure:				
Revenue	Rs.	1,426,780		
Capital	„	405,275		
			„	1,832,055
Estimated excess of expenditure over income ...			„	357,135

(*c*) *Ceylon Savings Bank and Bank of Ceylon Savings Accounts*—Consequent on the retirement of Dr. H. E. Young, the Acting Director, Mr. C. A. de Silva, was authorised to operate these accounts until the appointment of a Director.

5. Smallholdings Department:

The transfer of the headquarters of this Department to Dartonfield was agreed to in principle and detailed consideration was left for a later meeting.

6. Staff:

(*a*) *Plant Pathologist*—It was reported that Mr. A. Riggenbach M.Sc. had accepted the appointment of Plant Pahtologist on the terms offered and that he would assume duties in early December, 1955.

(*b*) *Asst. Plant Breeder*—Mr. D. M. Fernando M.Sc. was appointed Asst. Plant Breeder on his return from leave.

7. Publications:

The following publications and reports were tabled:

Advisory Circular No. 42A—New Local Planting Material for Small Scale Trials on Estates.
—do— No. 54 —Bark Rot and Canker of the Rubber Tree.
—do— No. 55 —Sustained Yield and Planting Density (Roneoed copy)
Bulletin No. 56 —Manurial Diagnosis for Hevea Brasiliensis Part II.

Mr. D. H. Constable's Report on Visit to Fernhurst and Jealotts Hill Station, 26th-28th Sept., 1955.
—do on XIVth International Horticultural Congress, Scheveningen, Holland, August-Sept., 1955.

8. Transport Contract:

Seven tenders for the Institute's transport services in 1956 were considered and that of Messrs. D. B. Sendanayake & Bros. was accepted.

9. Next Meeting:

It was agreed that the next meeting of the Board be held in Colombo at 2-15 p.m. on Wednesday 21st December, 1955.

The meeting terminated at 4-15 p.m.

Advertisements are accepted on the understanding that the Institute accepts no responsibility for the claims made therein.

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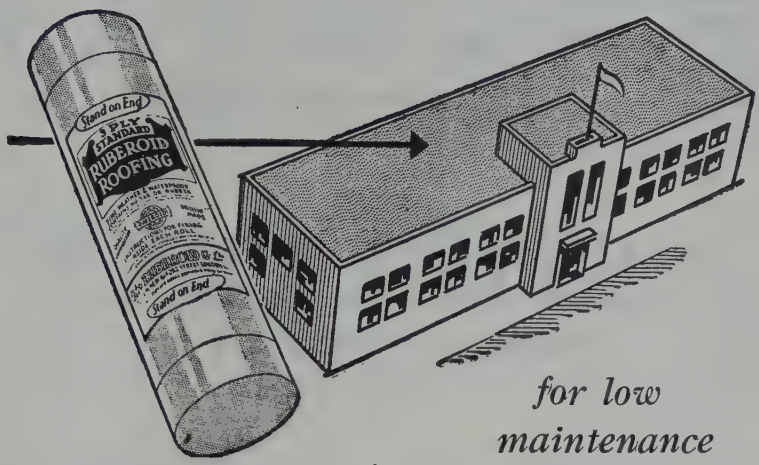

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● STIMULEX IS A NEW OIL BASE COMBINATION OF PLANT HORMONES, USED EXTENSIVELY IN MALAYA WHERE IT WAS PRODUCED AFTER 14 YEARS OF INTENSIVE RESEARCH.

● TWO APPLICATIONS OF "STIMULEX" PER ANNUM ON BARK OF RUBBER TREES, BELOW TAPPING CUT, CAN PROVIDE A LATEX YIELD INCREASE OF OVER 20% PER ANNUM.

● PLEASE ASK US FOR COMPLETE TECHNICAL DATA ON "STIMULEX" AND SEE HOW YOUR TREES CAN PRODUCE MORE LATEX AT NEGLIGIBLE COST.

The Ironmongers and Estate Suppliers of Ceylon

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What is Brunolinum?

Brunolinum Wood Preserver and Brunolinum Plantarium are Products evolved as the result of Patient and continued research, which as Germicides are highly toxic, non-dangerous and safely handled. These products have been used in Ceylon for many years with the greatest success.

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One of the most effective Wood Preservers and white ant destroyer known. Protects all varieties of woods from decay. Invaluable for all kinds of internal and external wood work.

DARK BROWN IN COLOUR

Supplied in bottles, 1 Gal. and 5 Gal. Drums.

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Prevents and cures all diseases of Rubber trees.

- For prevention of diseases of the tapping cut.
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A booklet descriptive of its great value and expert opinions in Ceylon and the Straits will be posted free on application.

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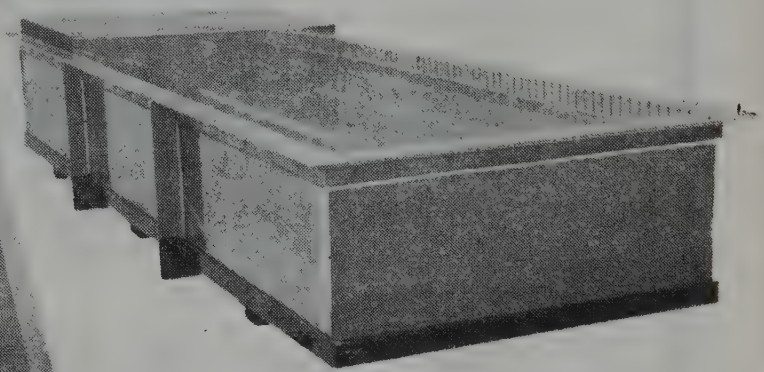
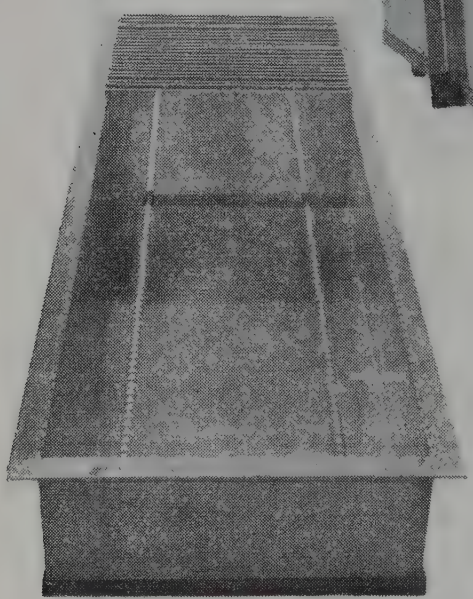
DCL ALL-ALUMINIUM COAGULATING TANK





IT IS MADE OF ALUMINIUM THROUGHOUT. The shell is formed of one plate of pure aluminium and the reinforcing frame is fabricated from aluminium alloy sections.

IT HAS SMOOTH SIDES AND ROUNDED CORNERS which allow of easy cleaning.

IT REQUIRES NO UPKEEP. Periodical painting or repairs are entirely eliminated.

ITS STRONG & LASTING CONSTRUCTION will ensure years of trouble-free service.

Available in the following sizes :—

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10′×3′×12″	75	Rs. 2220/-
10′×3′×12″	90	,, 2365/-
10′×3′×14″	75	,, 2125/-
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10′×3′×15″	90	,, 2360/-
10′×3′×16″	75	,, 2450/-
10′×3′×16″	90	,, 2635/-
10′×3′×18″	75	,, 2735/-
10′×3′×18″	90	,, 2945/-

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COLOMBO COMMERCIAL CO., LIMITED.

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SULPHUR DUSTING MACHINE

Also eminently suitable for large scale pest and disease control in Tea, Paddy, Coconut, Cocoa, Etc.

The MISTRAL II A is a dusting machine specially designed and constructed by the well known firm of Messrs. Birchmeier & Co., Ltd., manufacturers of spraying and dusting machinery since 1876.

The MISTRAL II A has demonstrated itself to be outstanding with regard to ease of operation and efficiency.

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WEIGHT OF UNIT: 79 lbs. only.
(with carrying handles 94 lbs.)

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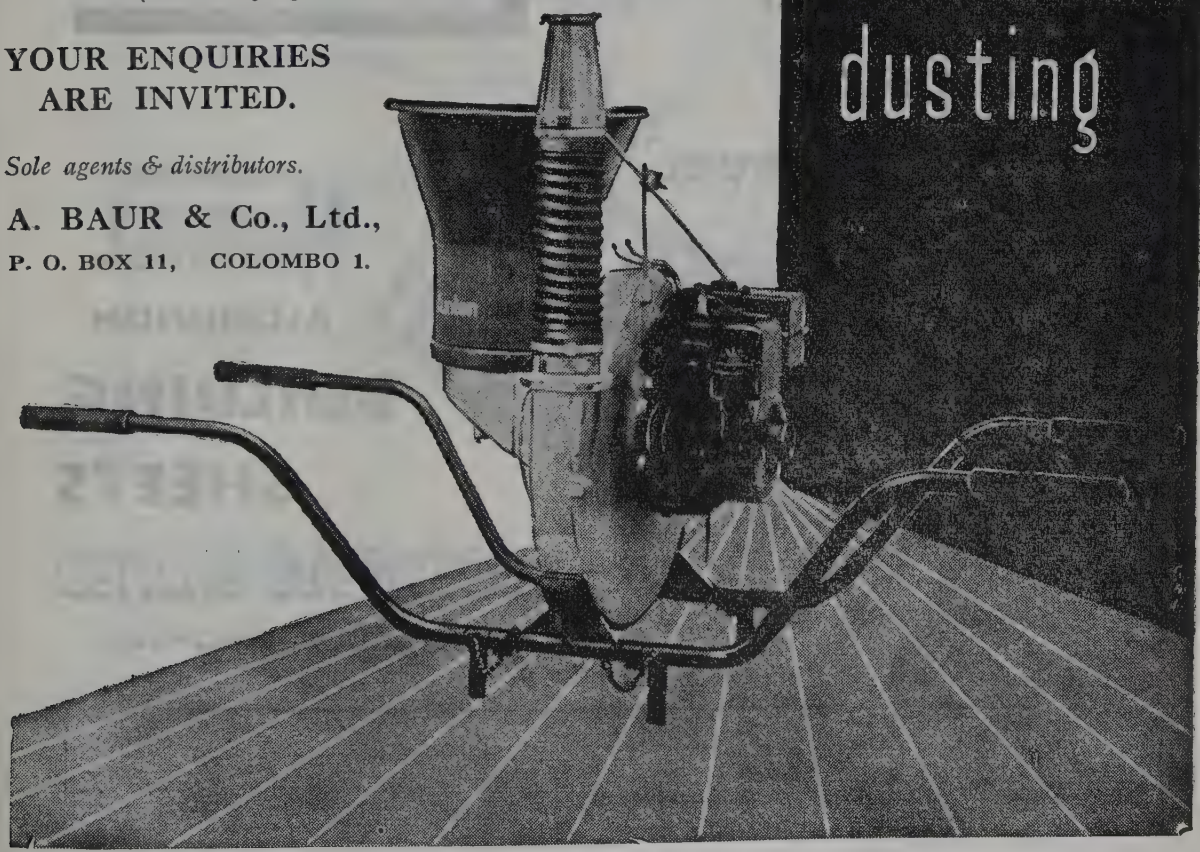
designed for efficient and economical dusting



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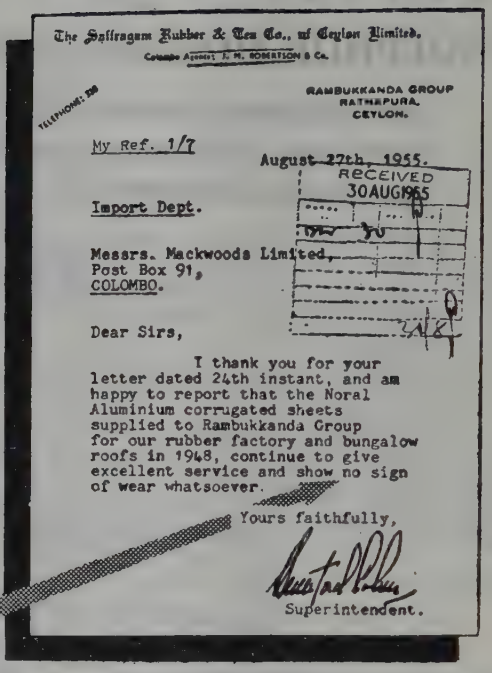

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Colombo Agents: J. M. ROBERTSON & Co.

TELEPHONE: 28

RAMBUKKANDA GROUP
RATNAPURA.
CEYLON.

My Ref. 1/7

August 27th, 1955.

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Yours faithfully,

Superintendent.

"...no sign of wear whatsoever"

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ALUMINIUM

BUILDING SHEETS

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WE RECOMMEND

BARK SEAL
RUBBER FUNGICIDE

FOR BARK RENEWAL.

PROTECTS THE CAMBIUM

PRODUCES MORE LATEX

CURES AND PREVENTS ALL
DISEASES OF THE TAPPING PANELS.
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AVAILABLE IN. 1 gl., 4 gl. and 45 gal. DRUMS.

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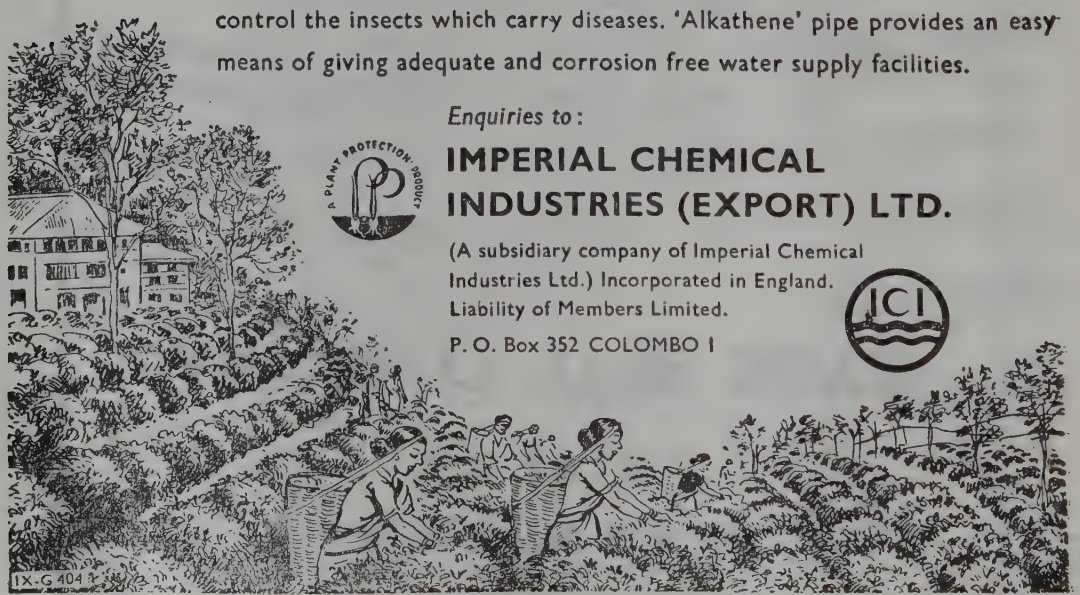
To protect the health of workers 'Gammexane' formulations control the insects which carry diseases. 'Alkathene' pipe provides an easy means of giving adequate and corrosion free water supply facilities.



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A balanced organic product manufactured in Calcutta

Analysis N 7% P.O. 10% KO 5%

ESSENTIAL TRACE ELEMENTS.

Approx : amounts :-

Calcium	6.63 %	Manganese	TRACE
Sodium	1.85 %	Boron	
Magnesium	0.003%	Iodine	
Copper	0.005%	Cobalt	

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All enquiries and other communications should be addressed to the Director, Rubber Research Institute of Ceylon, Agalawatta.